

Our Public Lands

Summer 1978

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**Birds of Prey
Snake River
Sanctuary**

See Page 3



U.S. DEPARTMENT OF THE
INTERIOR

BUREAU OF LAND MANAGEMENT

As the Nation's principal conservation agency, the Department of the Interior has basic responsibilities for water, fish, wildlife, mineral, land, park, and recreational resources. Indian and Territorial affairs are other major concerns of America's "Department of Natural Resources."

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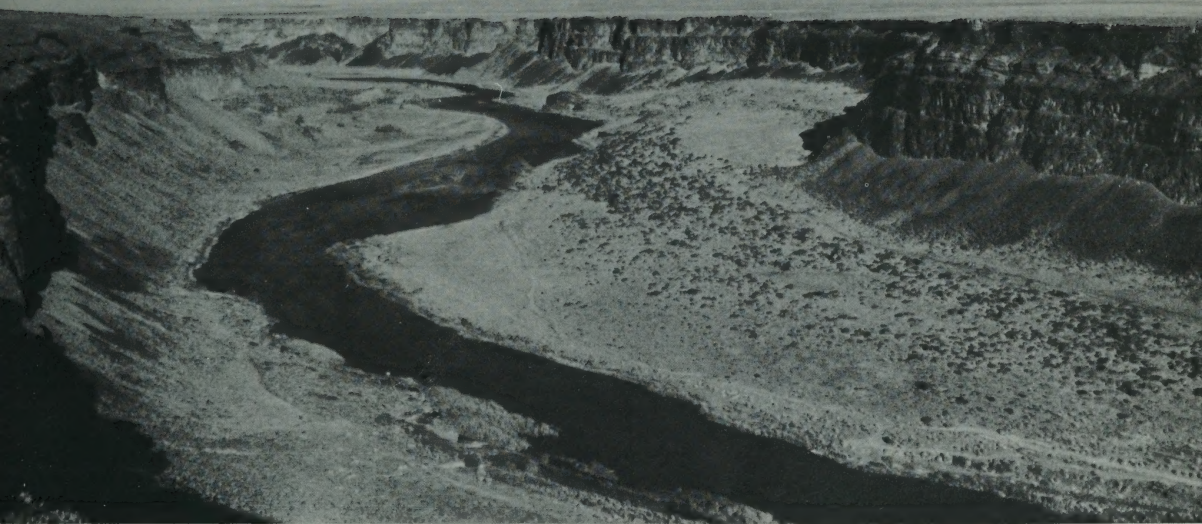
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Birds of Prey Snake River Sanctuary

Along Idaho's Snake River, Raptors Have a Place of Their Own.



KAREN STEENHOF

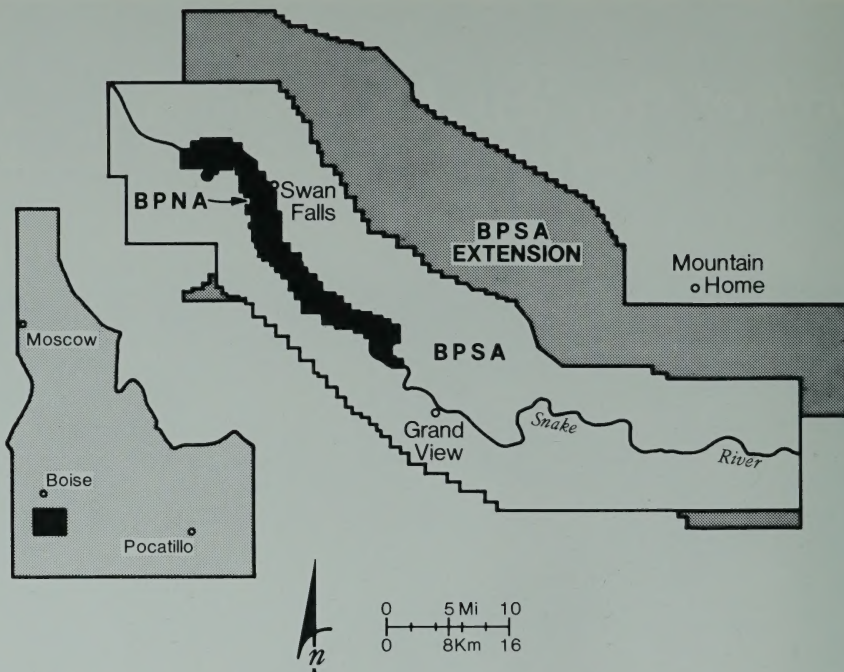
Boise, Idaho District Office

Each spring, as cheatgrass and ground squirrels emerge from the thawing desert soil, more than one thousand birds of prey congregate in the sheltered canyonlands along a seventy-five mile stretch of the Snake River in southwestern Idaho. The Snake River Birds of Prey Natural Area, less than an hour's drive from the city of Boise, provides a valuable and unique nesting area for birds of prey. Here, golden eagles, prairie falcons, red-tailed hawks and ten other species of raptors find suitable nesting sites in the crevices of towering volcanic cliffs.

The Natural Area and an adjacent canyon 42 miles upstream host the densest known nesting population of raptors in the world, and 80 percent of this nesting population is administered

by the Bureau of Land Management. BLM became actively involved in raptor habitat preservation and management in 1971 when the Secretary of the Interior signed Public Land Order Number 5133 forming the Snake River Birds of Prey Natural Area. This protective withdrawal preserved nesting habitat along 33 miles of the Snake River Canyon.

Prairie falcons are the most numerous of the 13 raptor species nesting within the southwestern Idaho sanctuary and further upstream. Last year 202 pair, approximately ten percent of the prairie falcons left in the world, nested along the 75 mile stretch of the river. Thirty golden eagles and 61 pair of red-tailed hawks also reared their young within this stretch of the Snake River Canyon in 1977.



Kestrels, marsh hawks, turkey vultures, Swainson's hawks, and ravens also select nesting sites within the canyon. Ferruginous hawks, the largest hawks in North America, nest in the cliffs and desert shrub surrounding the canyon. Bald eagles, rough-legged hawks, ospreys, sharp-shinned hawks, and Cooper's hawks use the area during the non-breeding season. The Natural Area also hosts six species of nocturnal birds of prey; the great horned owl, the barn owl, the screech owl, the short-eared owl, the long-eared owl, and the burrowing owl.

The canyon shelters raptors from the elements and predators. The canyon alone, however, is not adequate to sustain the birds, and the canyon is not the sole reason for the bird's intensive use of the area. The surrounding desert provides abundant prey and comprises the essential hunting grounds for all raptor in the area. For example, prairie falcons, who feed almost

exclusively on the Townsend ground squirrel, range more than ten miles from their nests to secure adequate food. Golden eagles must also hunt large desert expanses to secure their favorite food, the black-tailed jackrabbit.

Although the nesting sites of the raptors in the Natural Area had been preserved, the habitat that supports their prey just outside the Natural Area had not. Each year, more land was being planted in sugar beets, potatoes, alfalfa, and wheat under such public land disposal laws such as the Carey Act and the Desert Land Act. Unfortunately, jack-rabbits and ground squirrels are not compatible with agriculture.

The competition between men and raptors for the same piece of real estate was underway in 1972 when BLM hired Mike Kochert as a raptor research biologist. Some of the questions facing BLM then were:

- How much prey is required to sustain a nesting pair of raptors and their young?

- How much foraging habitat is needed for the birds to find adequate prey?

- Which desert habitats support sizeable populations of prey, and which specific areas and habitats do the birds use for hunting?

- What effect does cattle grazing have on prey populations?



A young golden eagle on its nest feeding on remains of a jack rabbit, a major food in the eagle's diet.

To answer these questions, Kochert started a multi-faceted study of the ecosystem in 1974. The study consists of ten projects. Nine of these studies have been contracted to universities, one is being conducted by BLM. The researchers investigate those elements of the ecosystem that influence raptors. The project, the first of its kind in the world, attempts to describe the relationships between raptors, prey, other predators and their habitat. The results of the research will be integrated into a computer systems model, the first of its kind to be developed for making Bureau management decisions. Ultimately, BLM scientists will be able to predict the effects of habitat alteration on the raptor population. With these predictions, land managers can opt for practices and uses that will protect the birds. Phase I of the Project seeks to find out how much land the birds need. Phase II will study the effects of various habitat management practices (fire, grazing, etc.).

In 1975 BLM temporarily stopped processing applications for land under the Desert Land Entry and Carey Acts on the Birds of Prey Natural Area and on an additional 290,000 acres considered as significant habitat for raptors and their prey. It was necessary to maintain the area in its natural state while the research was in progress. In 1977 Secretary Andrus, a supporter of the Birds of Prey Natural Area since its dedication, doubled the size of the study area under moratorium when research studies showed that raptors needed more desert land for their hunting area. The protected study area also includes canyon habitat 40 miles upriver from the Natural Area. These protected areas also provide nesting sites for birds of prey.

When the birds arrive in the spring, a team of more than 30 BLM scientists and technicians prepare for a hectic field season in the Natural Area and surrounding lands under Project Leader Kochert's direction.

One study, directed by Dr. Michael Wolfe, Utah State



Biologist Mike Kochert scales down the face of a cliff to collect the remains of prey found in a nest. Such collections provide valuable information about the feeding habits of the birds.

Research associate Gayle Sitter weighs a young prairie falcon for data in his study of the feeding habits and bioenergetics of raptors.





The cliffs of the high-walled rim seen from the floor of the canyon.

University, is designed to find out exactly how much prey is available on the hunting sites. Using a combination of trapping, transect census, and direct counts, Wolfe and his research associate, Larry Oftedahl, are seeking to determine the densities and habitat preferences of small mammals and birds in approximately 1,250 square miles of desert. Their findings will tell managers how many pheasants, rabbits, mice and songbirds are supporting the present raptor population. This information will be used as a base from which to measure the result of future habitat management programs.

A second study directed by Dr. Donald Johnson, University of Idaho, focuses on the ecological needs of the Townsend ground squirrel, the bird's favorite prey. Johnson and his research associate Graham Smith are surveying the habitat needs, population changes, and densities of this abundant, small, burrowing rodent that comprises more than 75 percent of the prairie falcon's diet. The breeding season for the prairie falcon corresponds to the time the ground squirrels emerge and start to breed in the spring. Johnson and Smith have learned

that the ground squirrel will not breed during dry springs.

Reptiles are also important in the raptor diet, and Lowell Diller, of the University of Idaho is studying the densities, habitat preferences and population dynamics of snakes and lizards in the area. Diller has found that rattlesnakes compete with raptors for Townsend ground squirrels.

The raptor's fiercest competitor is the badger. The lands around the canyon host one of the largest badger populations in the world. Each badger eats several squirrels a day that would otherwise be available for the birds of prey. Dr. Maurice Hornocker, of the University of Idaho, and Dr. John Messick, of the University of British Columbia, are studying the impact that badgers have on small mammals. Steve Cherry, of Utah State University, is studying the competition from another predator, the coyote.

BLM contracted with Dr. Thomas Dunstan, of Western Illinois University, to direct a radio telemetry study to determine the extent of the bird's hunting grounds and to provide information about their lifestyles. Dr. Dunstan has put radio transmitters on more than 50

raptors. He and his associates, Jim Harper and Ken Phipps, can identify the hunting areas used by individual birds by following the birds equipped with transmitters in vehicles with receivers and antennae. Dunstan will attempt to determine the total space that the raptors now use for hunting.

While Dunstan and his crew are watching the birds hunt in the desert, Dr. Steven Peterson and Gayle Sitter, of the University of Idaho, keep records of the number and kinds of prey that the adult raptors bring to their young. Peterson, Sitter and Mike Collopy, of the University of Michigan, use time lapse photography and observations from blinds to determine the amount of food eaten by the chicks.

Collopy is also computing the bioenergetics (the study of the energy required to keep a bird alive) of raptors. In time he will be able to predict survival and the gain in weight of young birds on a given ration of food from the experiments he has conducted with captive birds.

BLM biologists Mike Kochert, Albert Bammann and Karen Steenhof will integrate the information gained from these

studies. BLM research technicians led by Bammann, survey breeding pairs in the Natural Area and surrounding habitat to determine how many of the pairs return and how many of these breed. Later members of his crew enter the nests to find out how many eggs have been laid, how many young have been hatched, and the time of hatching. From some nests researchers collect regurgitated pellets containing bones, hair, and other indigestible items of food. From these, the biologist can determine what the birds are eating. Just before the young

Desert Land Entry and Carey Acts. The land in question amounts to less than 3 percent of all undeveloped irrigable Federal land in Idaho, but the same soil that is suitable for Townsend ground squirrels is also suitable for cultivation. Water for irrigation is available from the near by Snake River. This makes the land highly attractive for agricultural development.

Management plans are still in the development stage, but actions are being taken to protect the raptors. On the advice of BLM biologist, Doug Smithey, the

The research staff helps young birds survive by treating the nestlings for disease and by shielding the nests from the direct rays of the sun. Doug Smithey has tried to increase the number of nesting sites by erecting artificial nesting platforms. He hopes these artificial platforms will provide more protection from nest predators.

In 1977 the endangered peregrine falcon was successfully reintroduced into the Natural Area. Researchers from the Peregrine Fund placed three peregrine chicks hatched in captivity into a nest of a prairie falcon. The prairie falcons raised the young peregrine chicks as their own. Now researchers are waiting to see if the peregrines will return to set up nesting territory of their own.

The Snake River Birds of Prey Natural Area is one of the last areas where large populations of raptors can breed and rear their young. The ultimate fate of these birds rests on the choices we make between development and protection of the land. Ultimately it will be up to the citizens of the nation and their elected officials to decide.



The badger is a competitor of eagles and hawks for small mammals living in the desert lands surrounding the sanctuary. BLM is sponsoring intensive research to learn more about the natural history of these aggressive animals.

leave the nest, researchers count and weigh them and attach aluminum bands to their legs. Plastic wing tags are used to mark some birds so that they can be identified from a distance. Marked birds have been seen as far away as Arizona. Many nestlings have later returned to the area to breed.

Studies show that birds regularly hunt as far as fourteen miles from the canyon. Apparently, birds of prey require this much open desert in order to find enough food for their young.

Meanwhile many people are applying to BLM to acquire land within this same area under the

Bureau has closed several roads into the area during the nesting season. Shooting is prohibited in the canyon from March 1 to August 31. The Nature Conservancy, a national conservation organization of private citizens, is raising funds so that it can purchase key private lands used as nesting sites within the boundaries of the Natural Area. Smithey and Michelle Hudson, a BLM public affairs specialist, have developed an educational program about raptors that is presented to approximately 2,000 schoolchildren each year and also to special interest groups and civic clubs.



TABERNACLE HILL

A Black Island in the Desert

Volcanic Forces Built an Island of Lava in Old Lake Bonneville.

MARGARET MATTHIES

Richfield, Utah District Office

Along Interstate 15, near the town of Fillmore, there is a small black hill standing alone in the vast Black Rock Desert of West Central Utah. Known as Tabernacle Hill, it is actually the cone of a long extinct volcano. The hill and the volcanic field around it have a variety of volcanic features that are not found anywhere else in the United States.

The initial eruption that made

the hill and the field around it happened between 12 and 24 thousand years ago when the waters of Lake Bonneville covered the Black Rock Desert to a depth of approximately 80 feet.

That initial eruption was violent. Cinder and ash belched from the vent and were cemented into a circular cone approximately 3,000 feet in diameter by the waters of Lake Bonneville. As the eruption

From a distance, the central spatter cone and encircling tuff cone rise above the field of blackened lava.





Spatter cones viewed from close up. These cones are formed from an accumulation of lava during the period of eruption.

continued, the cone pushed above the surface of the water and continued to grow in this explosive manner until it stood at least 120 feet above the Lake.

Eventually the violent eruptions ceased and the volcanic cone became a peaceful conical island in the midst of Bonneville's gradually receding waters.

But it was not over. Between 11 and 12 thousand years ago a second eruption occurred from within the original cone. At that time the waters of the Lake were no more than 60 feet above the valley floor. The second eruption was not as violent as the first. This time lava merely oozed from a vent near the original one and filled the cone with a boiling cauldron of molten rock. The lava breached the north wall of the volcanic cone and poured into Lake Bonneville, increasing the size of the island.

Lake Bonneville continued to dry up and the area around Tabernacle Hill became dry land about 10 thousand years ago.

In 1872 G.K. Gilbert, the first geologist to write about the area, visited Tabernacle Hill. It was Gilbert who named the formation Tabernacle Hill Volcanic Field. He chose this name because the volcanic cone reminded him of the Mormon Tabernacle in Salt Lake City when viewed from the north.

The circular Tabernacle Field is the smallest lava field in the Black Rock Desert. It is approximately 3 miles in diameter and covers



Two visitors stand on the rim of the Tabernacle cauldrea. Caulderas are formed in much the same way as pit craters. The mound at the right is a spatter cone and the rim of the tuff cone can be seen in the background.

about seven square miles of area. The lava rock is from 40 to 60 feet thick.

A jeep road crosses the area from north to south, but a local miner has bulldozed sections of this road in an attempt to block entrance to his mine. This and the rough lava rock make driving difficult even for 4-wheel drive vehicles. However, the area has been discovered by school groups, Boy Scout troops and by spelunkers from various parts of the State. Because of the condition of the road, most of these visitors have to walk from the edge of the lava field, and a

limited time schedule often prevents them from seeing many of the area's outstanding features.

The road leads to the point of eruption, but there are points of interest along the way. To the north and east the lava flow ended in a 60-foot cliff. This cliff shows an unusual pillow-like feature that may have resulted from molten lava advancing into the water of Lake Bonneville. There is a fragment of a volcanic cone on the northern fringe of the field, evidence of an earlier eruption that was later inundated by the flow from Tabernacle Hill.

As the lava cooled, the surface was first to solidify, forming a crust over fluid lava below. "Squeeze ups" abound in the northern and eastern portion of the field. These are lava mounds, some 30 feet high and 40 feet wide, that were frozen into place as molten lava from below oozed through cracks in the solidified crust. In cooling the surface of these mounds cracked like bread crust to form orange and black polygonal blocks. Pressure ridges, formed in the same way, but larger in size, are another common feature of the field.

On the lava plain the surface crust frequently overlays tubular cavities called lava tubes or tunnels. These form when molten lava continues to flow beneath the surface. As the subsurface cools, it also solidifies leaving the hollow tube that may stretch for miles beneath the surface.

Lava tubes are among the interesting features of the field. It is possible to follow one very

large tube for almost a mile. The passageway varies from 15 to 40 feet high and is from 20 to 150 feet wide. Along some segments of this tube the roof has collapsed, allowing the surface crust to drop down into the tube. In other sections narrow sections of roof remain forming natural bridges—archways of basalt that continue to span the tube after most of the roof has caved in.

A lava tube is found only after a portion of its roof has collapsed. Much of the Tabernacle field is thought to be hollow, but if this is so, there are no entrances into most of these underground chambers.

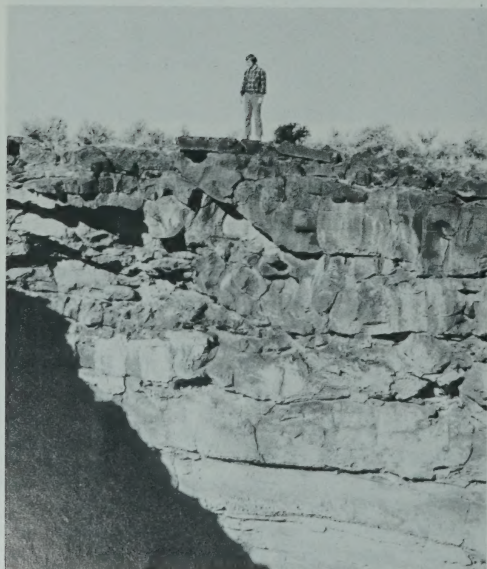
In the early 1900's some boys found the skull of a camel in one of the lava tubes. How it got there no one knows, paleontologists know that both camels and mastadons lived along the shores of Lake Bonneville. It is thought that these animals disappeared from the area at about the time that Lake Bonneville dried up. It may be that the skull came from a remnant population that survived

in the area until after the lava tubes were formed some 10 thousand years ago. Perhaps a predator dragged the carcass down inside the lava tube where dry surroundings preserved the bones.

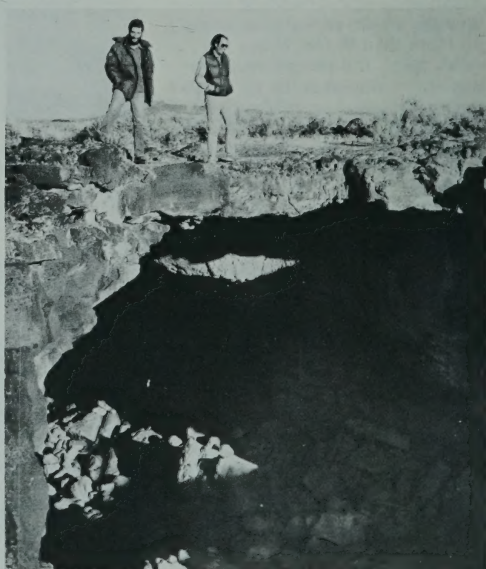
If animals used the area, what about primitive man? Did he also use these natural shelters? BLM archaeologists don't think so. The lava field is devoid of artifacts except for a few scattered obsidian flakes and stone tools that have been found along the northern rim. Petroglyphs can also be found in the same area.

Following an eruption, a lava field is a sterile landscape. Great heat and barren rock offer no succor to any living thing. But after the eruption stops and the rock cools, natural forces start to transform the barren rock into a more hospitable environment. The field around Tabernacle Hill is now in an early stage of ecological succession.

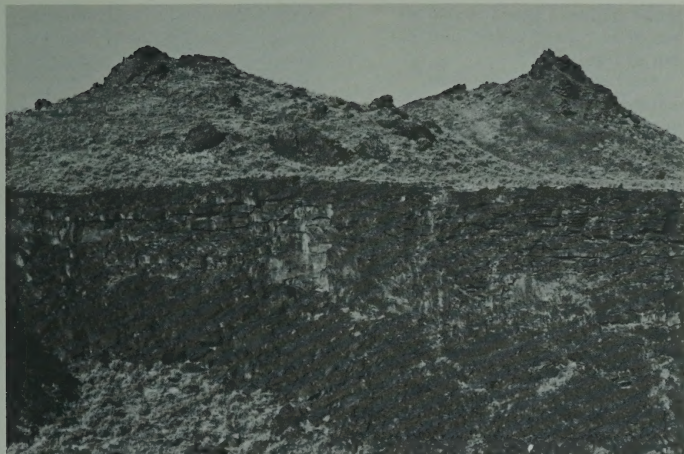
Sagebrush and various grasses have penetrated into the area, and a forest of Utah juniper grow



A visitor looking into a pit crater. These circular pits measure up to 40 feet deep and are surrounded by perpendicular walls.



Standing on the roof of a lava tube. One lava tube in the Tabernacle field can be explored for almost a mile.



Two spatter cones 80 feet high. Once the volcano is in eruption cones build rapidly as a result of fire fountaining. The cauldron wall is in the foreground.

on the western edge of the field. Individual juniper have also taken root on the northeast face of the cone.

This growth makes the area more inviting to a variety of animal life. Bird sightings are common. Ravens, pigeons, great horned owls, prairie falcons, and red-tailed hawks find shelter in the fissures, pits and cliffs found in the area.

A great variety of snakes, and lizards inhabit the area, and there is at least one species of frog—which seems odd since there is no permanent water supply. The Great Basin Rattlesnake is the only poisonous snake found in the area. However, they are rarely encountered by visitors.

Small mammals include the ground squirrel, rabbit and mouse. Larger animals such as the coyote, badger, bobcat and kit fox can occasionally be seen at dusk or dawn.

Very deep, prominent pit craters abound in the western portion of the field. These circular pits have round, smooth rims and sheer perpendicular walls. They are from 30 to 40 feet in diameter and are between 30 and 40 feet deep. Pit craters are formed in

much the same way as lava tubes. After the cavity has formed, the roof collapses leaving a pit crater. In this case the collapsing roof blocks the tunnel where the molten lava has escaped leaving a pit rather than a tunnel.

One very deep pit harbors a small forest of what are believed to be chokeberry shrubs. This shrub is not found anywhere else on the field. The forest probably got its start when a bird dropped a seed that found the dampness of the pit suitable for growth.

The eruptive center has four very conspicuous formations: a volcanic cone, a cauldron and two spatter cones. The cone is all that remains of the first eruption, and only about two-thirds of the cone remains. We believe that the cone was once 3,000 feet in diameter. The remaining cone is some 2,200 feet from crest to crest. The cone is highest on the east side where it rises 120 feet above the lava field, and 180 feet above the valley.

The cauldron, located within the tuff cone, is by far the largest collapse structure on the field. It is some 1,000 feet wide and 60 feet deep.

The two spatter cones tower 80

feet above the floor of the cauldron. They are the products of the second eruption. The spatter cones were built rapidly by fire-fountaining which expelled clots of liquid lava from the vent. Lava bombs, which are globs of lava that harden in flight to form football and ribbon-like shapes, can be found on these two miniature volcanic cones.

A management plan for the Tabernacle Hill Volcanic Field is being prepared by the Bureau. Hopefully, with planning and action, BLM can preserve and interpret the recreational, geological and other public values of the area.

Schools groups, boy and girl scout troops and other have been attracted to the area because of its educational and recreational values. BLM had plans to preserve the unique geologic features of the area.



MIKE SAWYERS
Idaho State Office

tablet paper; a practice that all but drove conservation officers out of their minds.

After clean farm practices started in the late 1960's, food and winter cover started to disappear from the area and the wildlife populations went into decline. With the obsession for clean farms, weeds and stubble were burned along the edges of fields, and fall plowing laid bare the soil. Cement ditches were installed and circular sprinkler systems

wildlife against the adversities of winter. Even where such items existed they were seldom found together—a definite requirement for the pheasant's well being.

However, not all has been lost. BLM still manages many isolated tracts of public land throughout southern Idaho. These tracts, ranging between 20 and 320 acres, have always supported populations of ring-necked pheasants, but now the onslaught of clean farming on the Snake River plains

HABITAT ISLANDS FOR WILDLIFE

*Extensive Management of Isolated
Tracts Promises Benefits for Wildlife.*

If you looked at the world through the eye of a ring-necked pheasant, you would see that the face of Idaho has changed drastically since 1960. Looking at the world through the eye of a pheasant hunter would give pretty much the same picture.

During the 1950's, Idaho's Snake River Plains, a vast sweep of sagebrush and farmland that reaches across the southern part of the State, offered some of the best ring-necked pheasant hunting in the United States. As late as 1968, BLM wildlife biologists counted 47 hunters from 11 states hunting on the Milner site near Burley.

During the best years, motel rooms were reserved for the hunting season a year in advance. Vacant camp sites were as rare as an uncooked steak and tents sprouted in borrow pits and along road sides. Once, when vendors ran out of the proper forms, hunting licenses were written on

allowed farmers to irrigate and cultivate areas that had previously been ideal for wildlife. These practices continue today.

As the pheasant population declined, the State restricted bag limits and hunter interest declined. The impact on the local economy was inevitable. Businesses in the Burley and Rupert areas were the first to feel the pinch.

As public lands in the area passed into private ownership under the Desert Land Entry and the Carey Act even more pheasant habitat was lost. Both Acts provided for private individuals to acquire public lands provided they irrigated and cultivated the land.

To the pheasants and other wildlife, these changes spelled disaster. The habitat no longer provided all essentials for the bird's survival. Among these were food, escape cover, and the kind of vegetation needed to protect

makes them increasingly valuable for pheasant habitat. Some are literally islands of favorable pheasant habitat in a sea of cultivation.

When pheasants were plentiful, BLM managers saw little need to manage their habitat in the light of other priorities, but with populations in decline the value of the scattered tracts became obvious. BLM biologists worked with personnel from the Idaho Department of Fish and Game to plan a program to boost the ring-neck population in southern Idaho.

Initially about 15,000 acres of public land having a potential to provide pheasant habitat are involved. Tracts slated for development are found along the Snake River south of Hagerman in the Boise District and in Twin Falls and Cassia counties in the Burley District. Management plans were prepared under the authority of the Sikes Act which directs BLM



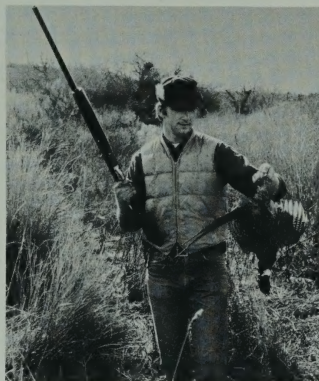
BLM employee, Mike Rath examining a planting of 4-wing salt bush. Such plantings provide both food and cover for pheasant and other wildlife.

to cooperate with State wildlife agencies to plan for the effective management of habitat to increase wildlife on the public lands.

Tracts will be fenced to prevent livestock and agricultural trespass, and dry-land trees, shrubs and forbs will be planted to provide windbreaks and escape and wintering cover needed by the birds.

While implementing the program, biologists consulted with personnel from the U.S. Forest Service's Intermountain Forest and Range Experiment Station who have developed plants that are particularly well adapted to the arid west. The Station now has successful plantings along Interstate 80 where the soil and precipitation is similar to that on the tracts slated for development. Seed and transplant stock from the station has been used in plantings on the tracts. Further testing will determine their adaptability to the BLM lands. Many of the tracts being developed are adjacent to private farm land. BLM and the Idaho Department of Fish and Game are

A hunter checking a pheasant cock killed on an isolated BLM tract managed for wildlife.



working out cooperative agreements with interested local farmers. Such agreements allow the farmer to cultivate a part of a given tract if, in return, he will irrigate an equal amount of land set aside for wildlife habitat.

Farmers who enter into such agreements must follow a schedule of crop rotation approved by BLM and the Department of Fish and Game. According to the schedule, the farmer must grow grains or alfalfa five years out of a seven-year rotation. He can then grow potatoes or another cultivated crop the remaining two years. This system provides the food and cover needed to support a large pheasant population. When the grain is harvested the farmer is required to leave a five-foot strip standing at the edge of the field. The harvesting operation also leaves stubble which serves as cover for the birds. Livestock are not allowed on that portion of the tract reserved for wildlife, and farmers are required to control weeds.

These cooperative agreements provide for more intensive

management of the tracts than would be possible if either the State or BLM had to do all the planting and harvesting. There is a further advantage since, under the agreement, private lands involved in the program are opened to hunting.

In past years, most of the private land in this area was ringed with "No Trespassing" signs, and even some of the public land was not accessible to hunters since it was surrounded by closed private lands.

The purpose behind the program is to increase the pheasant population at a time when their numbers are declining in other areas. As the grasses, shrubs and forbs grow taller, so will the benefits to both the hunting and non-hunting public. Wildlife biologists expect a ten-fold increase in the pheasant population in the managed areas. BLM biologists expect management and development to improve the hunting on adjacent lands. A total of 220,000 acres will be affected. As a result, the opportunity for pheasant hunting is expected to sky-rocket. The two agencies estimate that the program will provide up to an additional 40,000 hunter days when maximum development is reached.

Other wildlife will benefit from the program. The populations of mourning doves and hungarian partridges are expected to increase along with small mammals that provide food for hawks, eagles and owls.

Fencing of the tracts will help control trespass, and the experience gained in planning and managing the tracts will be useful in other public land areas. Plants that prove well adapted to the area will be used in the rehabilitation of land scarred by fire or other disasters.

Many local farmers have entered into cooperative agreements, and other agreements are in the process of negotiation. Ideally the program will bring together the ingredients needed to improve the pheasant population of the State.

Topaz Collecting in Western Utah

*On the Public Lands of Western Utah Topaz
a Rare Gem Mineral Can Be Had for the Finding.*

Topaz—the word brings to mind a beautiful sparkling gem transmitting rays of golden sunlight stored in its depths eons ago, a precious stone most people might dream about but few could ever hope to collect. Fortunately for those who are interested in collecting topaz, that is not the case in Western Utah. There are several localities where anyone who is willing to spend the time and effort can find sparkling crystals of this precious gem.

Since gem and mineral collecting has become a popular hobby, collectors spend thousands of days each year in the field searching for a variety of gems—agate, jasper, opal, aquamarine and petrified wood, and collecting mineral specimens such as quartz, pyrite, galena and many others. Collectors have formed clubs in every major and numerous small cities all over the United States. During club meetings they discuss

collecting, cutting and mounting techniques and plan gem and mineral shows and field trips.

In spite of the excitement of the gem and mineral shows and the personal warmth and education of information gathered at club meetings, field collecting is the activity which attracts the most newcomers and keeps the oldtimers active. Only in field collecting can one experience the thrill of finding that special gem or mineral specimen, unlike any

other ever found. Collecting also takes the hobbyist out-of-doors to rivers, lakes, mountains, deserts and old mines with exotic names like Graveyard Point, Hallelujah Junction, Green Monster Mountain, Finger of Fate and Old Woman Mine.

Among the collecting localities that exist the world over, there is one that attracts more visitors than any of the others—it is the Topaz Mountain locality on the south end of the Thomas Range in

LARRY REAM

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ROCKHOUNDERS WELCOME

Rockhounding is recognized as a legitimate recreational use of public lands administered by BLM and with few exceptions these lands are open to rock collecting.

At the present time Federal Regulations apply only to the taking of petrified wood from BLM lands.

According to these regulations, the collector may take up to 25 pounds of petrified wood per day plus one piece (to prevent the necessity of breaking up a single heavy specimen). Total collection cannot exceed 250 pounds of petrified wood per year. The use of explosives and heavy equipment to remove specimens is also prohibited. There is no limit on other kinds of minerals, with the exception of regulations that may apply to special areas.

To those collecting in unfamiliar areas, we suggest that they contact local BLM offices for additional information about local opportunities and possible restrictions that may apply in special areas. Please remember that the above information does not apply to State or private lands, and that other Federal agencies may have more restrictive regulations.

the BLM Richfield District of Western Utah. Here even the beginning collector can find specimens of gem quality topaz. A few localities offer the collector an opportunity to collect a gem, but this one offers a bonus of specimens for the mineral collector as well.

Topaz can be found in crystals suitable for faceting into valuable gem stones, mounting in jewelry as they naturally occur, or suitable as exotic mineral specimens which are much sought after by even advanced mineral collectors. In providing such booty, the mountain does not stop there. It can also be coaxied into giving up crystals of rare minerals, including red beryl, bixbyite and pseudo-brookite, all three in better quality and size than those from almost any other locality in the world.

Topaz was first discovered in the Topaz Mountain area in the late 1800's. The other minerals were discovered soon after that. Discoveries of red beryl and bixbyite were pioneered by Maynard Bixby, a Salt Lake City collector. His discovery of red beryl was the first time that mineral had been discovered with a red color, and his discovery of bixbyite was the first discovery of that mineral, which was later named for him.

Since the discovery of these minerals, collectors have been going to Topaz Mountain in ever-increasing numbers. With the boom in the popularity of rockhounding and gem and mineral collecting in the last decade, this locality has become the most popular in the world. During all the seasons of the year, collectors can be found at Topaz Mountain. More than 300 cars, trucks and campers can be found in the main area on the south side of the mountain on some week-ends in the spring.

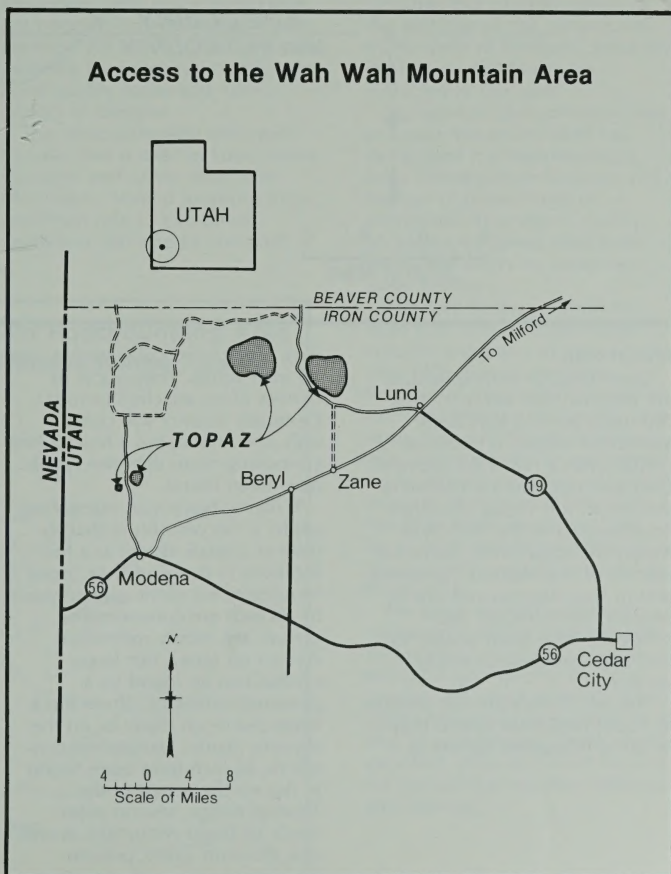
Red beryl was discovered in the Wah Wah Mountains about 20 years ago, but there was no production and the information did not leak out to collectors. In 1976 the claims changed hands

and production of these beautiful specimens began. Crystals up to one inch in length, and often of gem quality, occur in this locality. Faceted stones as large as three carats have been cut from these crystals. The stones are pink to red in color, although some are a dark red rivaling rubies in beauty.

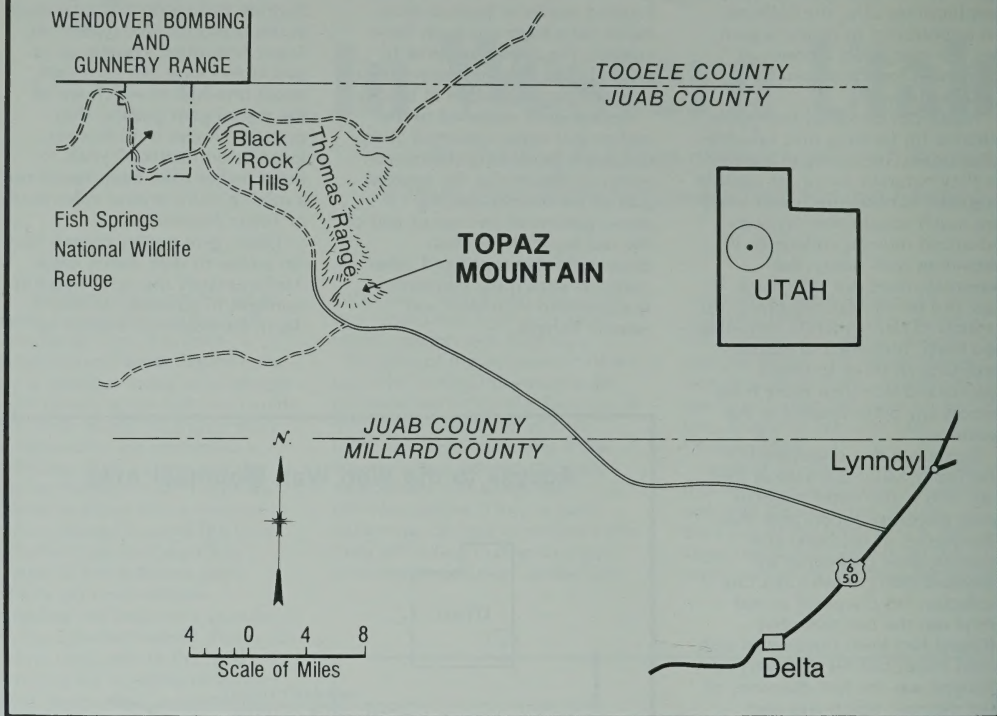
Rockhounds reported to the author that topaz occurred in an unknown location in the canyon north of Modena in the western part of the district. During investigations of this report and of the red beryl, the author discovered that topaz and other minerals were quite common in the southern Wah Wah and Needle Ranges.

Of all the minerals, topaz is the most sought after, because of its size, beauty and gem quality. Topaz is an aluminum silicate fluoride hydroxide that crystalizes in the orthorhombic system. At Topaz Mountain, crystals up to two inches long can be found, about one-half of which are of the crystal gem quality. They occur as singles or in clusters, loose or on matrix. Crystals to three inches have been found on a mining claim several miles north of Topaz Mountain.

Clear, gem quality crystals have an amber to dark sherry color. Unfortunately the color fades in sunlight to colorless. In room light, the color will remain for



Access To Topaz Mountain Area



several years.

Quite popular with collectors are the small red beryl crystals. Although beryl, a beryllium aluminum silicate, is common, crystals with a red color are rare. Only two deposits are known in the world, the Topaz Mountain occurrence and the Wah Wah Mountain occurrence. There are reports of two more occurrences, one in New Mexico and one in Mexico, but in recent years collectors have been unable to find any specimens at either locality.

The red crystals are uncommon at Topaz Mountain where they occur as hexagonal tablets of a

dark pink to red color, rarely over .25 inch across. They occur in cavities often attached to topaz. Generally a cavity will contain only one crystal, but a few cavities containing more than 40 crystals have been found.

Bixbyite, black iron manganese oxide, is uncommon as sharply distinct crystals except at a few locations in the world. At Topaz Mountain, excellent cubic crystals to .25 inch are common. The crystals are mostly micro-size crystals on topaz, but larger crystals can be found by a persistent collector. These black cubes occur on topaz or on the rhyolite matrix. Exceptional crystals to .65 inch have been found in the northern part of the Thomas Range, several miles north of Topaz Mountain. A rare iron titanium oxide, pseudobrookite, occurs with the other

minerals at Topaz Mountain. It forms long needle-like crystals, often in clusters, that radiate from a common point. The crystals are common to .5 inch long. These black submetallic crystals found on the white rhyolite matrix are quite showy.

Garnets are uncommon in the Topaz Mountain area, but they occur as sharp distinct crystals with some frequency to .25 inch and rarely to 1.5 inches. Most often the larger crystals are irregular, poorly formed.

Fluorite, calcium fluoride, is locally common. It occurs as purple crusts that are comprised of micro-size cubes. It coats the rhyolite and serves as the base for other minerals.

Quartz is very common as colorless to blue crystals less than .25 inch long. The crystals coat most cavities and form the

background for the other minerals.

In the Wah Wah and Needle Ranges the occurrences and mineral descriptions are the same as at Topaz Mountain. The minerals are commonly of a smaller size and the topaz is a lighter color. The bixbyite and pseudobrookite occur in micro-size crystals only. Red beryl occurs to one inch, often in the finest gem quality crystals.

Although the various minerals occur throughout the Thomas Range, the best collecting area is in the large valley on the south side of Topaz Mountain known as Topaz Valley. Topaz occurs in several areas on the east and west sides of the valleys. The southernmost of three pits on the west side produces some of the largest and best crystals, although a knob of rhyolite in the center of the valley also produces large crystals.

Red beryl occurs in the northernmost pit on the west side and in the steep cliffs on the east side. The beryl crystals are often perched on topaz.

Bixbyite is most abundant in the center pit on the west side. Small crystals of topaz are most

common, but a few to .25 inch have been found. On the east side of the valley, crystals to .25 inch occur with topaz and red beryl.

Two areas produce pseudo-brookite in abundance. One is in the north central part of the valley and the other is on the west side, just north of the northern pit. At both locations, fine clusters of crystals can be collected.

A few fine garnet crystals can be found in the northeastern part of the valley. Large poorly shaped crystals occur with the topaz at the knob in the center of the valley. The finest crystals are at Garnet Basin west of Topaz Valley.

In the Wah Wah and Needle Ranges, the best mineral specimens are red beryl crystals from a locality in the Wah Wah Mountains. This is a mining claim, not open to collectors, but it does produce the world's finest crystals available for purchase. Nearby are good quality topaz and micro-crystals of bixbyite.

The most accessible area open to collectors is west of Lund in the southern end of the Wah Wah Mountains. Several locations in an area from one to two miles northwest and one to one and

one-half miles northeast of Mountain Spring Peak produce topaz and fluorite. One area, one and one-half miles northeast of the peak, produces topaz and micro-bixbyite, pseudobrookite and fluorite. The minerals occur in a gray to maroon rhyolite that caps most ridges and peaks in the area.

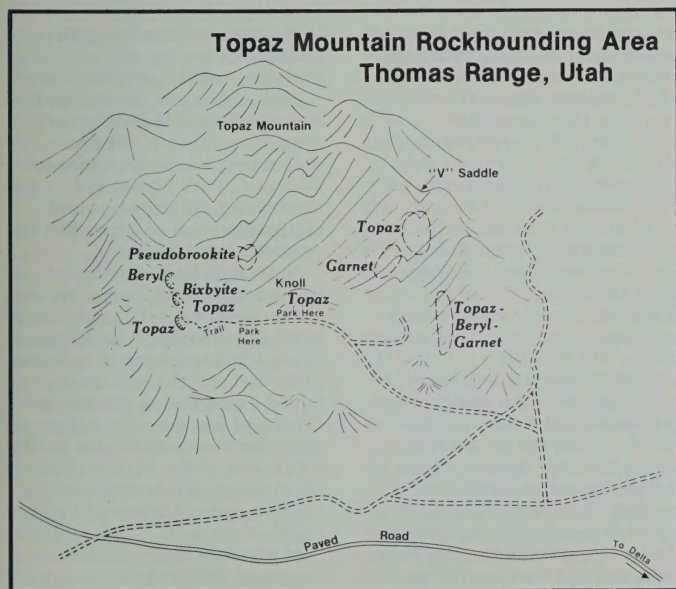
The finest topaz crystals, equal in gem quality but smaller than those of the Topaz Mountain area occur at the western end of Ponderosa Park. Topaz can be found in the rocks on both sides of the canyon the length of Ponderosa Park, but the finest crystals occur in a small outcrop of gray rhyolite in a stand of willows on the western end.

Excellent specimens of topaz can be found in the maroon rhyolites that cap the ridges on the east side of the canyon, six miles north of Modena. Some fine clusters on matrix can be collected in this area.

To maintain the collecting area at Topaz Mountain, BLM has designated it a Rockhounding Area. Mining claim location and the use of power tools is prohibited. This area is readily accessible by paved road from Delta, but offers no water or other facilities.

The area to the south in the Wah Wah and Needles Ranges are virtually unknown to mineral and gem collectors at this time. Because of the greater quality of the Topaz Mountain crystals, it is likely that only those collectors who are interested in specimens from unusual localities will go to this area to rockhounding trips. The Wah Wah Mountains' red beryl mine should continue to produce high quality crystals for many years.

For those rockhounds and collectors who are interested in an exciting trip to obtain some beautiful gem quality topaz crystals and other minerals, go to Topaz Mountain or the Wah Wah and Needle Ranges. These are all excellent areas for collecting and for spending a few days camping and relaxing.



They Painted the West II

GEORGE CATLIN— Artist on Crusade

PAUL C. HERNDON
Office of Public Affairs

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It has been said that George Catlin was the first artist of stature who made painting the West his career. But when he first arrived in St. Louis in the Spring of 1830, he was known only to a small circle of friends and fellow artists and was something considerably less than an artist of stature. Then, his only claim on the future lay in his burning purpose to leave a detailed record of the American Indian and his culture before all was spoiled by the advance of European civilization.

We can only speculate about how that happy combination of circumstances that lets a man match his talent with his innermost aspirations comes together. For Catlin, it happened on a street in Philadelphia while a delegation of western Indians were visiting the city.

Catlin, who had been trained in the law, had already forsaken a legal career to become a painter. No one can possibly describe Catlin's reaction to the sight of the visiting delegation better than Catlin himself:

"My mind was continually reaching for some branch or enterprise of the arts, on which to devote a whole lifetime of enthusiasm; when a delegation of some ten or fifteen noble and

dignified-looking Indians, from the wilds of the 'Far West,' suddenly arrived in the city, arrayed in all their classic beauty—with shield and helmet—with tunic and manteau—tinted and tasseled off, exactly for the painter's palette! In silent and stoic dignity, these lords of the forest strutted about the city for a few days, wrapped in their pictorial robes, with their brows plumed with the quills of the war-eagle, attracting the attention of all who beheld them. After this they took their leave for Washington City, and I was left to reflect and regret, which I did long and deeply, until I came to the following deductions and conclusions . . . Man, in the simplicity and loftiness of his nature, unrestrained and unfettered by the disguises of art, is surely the most beautiful model for the painter—and the country from which he hails is unquestionably the best study or school of arts in the world . . . And the history and customs of such people, preserved by pictorial illustrations, are themes worthy of the lifetime of one man, and nothing short of the loss of my life shall prevent me from visiting their country and becoming their historian . . . I set out on my

arduous and perilous undertaking with the determination of reaching, ultimately, every tribe of Indians on the Continent of North America, and of bringing home faithful portraits of their principal personages, and full notes of their character and history. I designed, also, to procure their costumes, and a complete collection of their manufacturers and weapons, and to perpetuate them in a *gallery unique*, for the use and instruction of future generations."

Obviously it was an ambitious dream—filled with idealism and simplistic concepts. Yet that dream became the blueprint for George Catlin's future, and throughout the hardships and disappointments of a long life, he never deviated from it.

As soon as he had gathered enough money to finance the trip, Catlin appeared in St. Louis with a letter of introduction to William Clark. Clark had been a co-leader with Meriwether Lewis on the famed expedition to the Pacific Coast and was then the Indian agent for the United States to all tribes west of the Missouri River. His approval was essential for the kind of project Catlin had in mind.

At that first meeting, Clark examined the young artist with a



Ta-wah-que-nah—the Mountain of Rocks. This portrait of a Comanche Chief was painted in 1834. It documents the fact that some Indians grew beards.

practiced eye. Before him was a small man, only five feet eight inches tall and weighing no more than 135 pounds. He was not quite handsome. The eyes were the most compelling feature—keen blue—they met Clark's appraising glance without flinching or wandering. There was a distinct scar across the left cheek. Ironically, that scar had been made when, as a child, he and a companion were playing with an Indian tomahawk.

Clark liked what he saw and was impressed by the scope of Catlin's proposed project. Like most men of his day, Clark was convinced that the Indian was doomed to extinction, and recognized a need for a visual record of their prominent men and of their culture.

He not only gave Catlin his blessing, but introduced him to Indians who were then visiting St. Louis.

For the next two years, Catlin traveled out of St. Louis painting portraits of leaders of the various tribes. Among these were Indians from the Sauk, Fox, Oto, Omaha,

Kansas and Pawnee tribes. During these years he visited some of the same villages that Titian Peale and Samuel Seymour had visited eleven years before.

The two years were highly productive. Catlin then had a gallery of respectable proportions. Many artists would have considered their mission complete. Not Catlin; with him, the flame of dedication burned with increasing intensity.

For one thing, he believed that the tribes and individuals he had painted had already been corrupted by the white man's influence. He longed to find Indians in their "purest state." Toward that end, he made even more ambitious plans for the year 1832.

Fortunately for a project that required such extensive travel, the river steamer had come into common use by the time Catlin arrived in St. Louis. In the Spring of 1832 he boarded the American Fur Company's steamboat "Yellowstone" to travel upstream to Fort Union. It was to be a history making voyage. Fort Union was a

thousand miles further upstream than any previous steamboat had traveled before. Among the passengers who traveled with Catlin were a number of Indians returning from a trip to Washington.

Catlin was ever sensitive to the corruptive influence the white man was exerting on the Indian. Among the members of the returning Indian delegation was Wi-jun-jon, the Pigeon's Head (also referred to by some authorities as "the Light.") Catlin had painted Wi-jun-jon's portrait when he had passed through St. Louis on his way to Washington the previous spring. Now he hardly recognized the man. Wi-jun-jon had been deeply impressed with the sights, sounds and paraphernalia of the white man's world and had, so to speak, "taken on airs."

On his return trip, he had exchanged his familiar tribal robes for the military uniform the Government gave all Indians when they visited Washington. He came aboard the Yellowstone in tight-fitting leather shoes, tunic and trousers along with a parasol and high hat. Catlin described him as "stepping like a yoked hog."

In a moment of inspiration, Catlin painted a full-length portrait of the over-dressed traveler to contrast with the portrait he had painted of Wi-jun-jon before he had visited Washington.

The "before and after" impact of the two portraits have a humorous impact that Catlin used to bring home what he felt was a grim message. Like many idealists of the time, he accepted without question the theory that primitive man was nearest to the perfect man and that all influences that weaned him from the primitive life were evil. The contrasting portraits of Wi-jun-jon are among Catlin's best known works.

Catlin rode the Yellowstone to Fort Union located just inside what is now the boundary of Montana. Along the way he had taken advantage of stopovers to

paint portraits of the western Sioux and later of the Mandans.

The agent in charge of Fort Union was Kenneth McKenzie who introduced Catlin to prominent Blackfeet and Crow and made a room available where he could pose the Chiefs for their portraits.

The Crows and the Blackfeet were traditional enemies, but each recognized the Fort as neutral territory. Until recently the Blackfeet had been formidable enemies of the white trappers who entered their territory, and now they posed in robes decorated with hair taken from white scalps.

Catlin came to regard the Crow as the most handsome and most elegantly dressed of all the tribes.

All the Indians looked upon Catlin as a great medicine man. Up until this time, Indian drawings had been exceedingly primitive—the human form usually represented by stick men. Catlin had the ability to create a remarkable likeness of the human face with only a few deft strokes of his brush. This amazed the Indians.

Like many primitive people, the Indian had ambivalent feelings about his own likeness. On one hand, he was susceptible to flattery and vain enough to consider his own face the most handsome in the world, but he also had great anxieties. The likeness of a man must, in the Indian's way of thinking, possess a measure of his soul that could be used by one's enemies, both human and superhuman, to cast evil spells on a man. But Catlin was persuasive and in almost every case vanity won out over anxiety.

After Catlin had finished a portrait, he would hang it for all to see, and the subject would stand for hours to gaze at his own face. In some cases, a subject would carry the painting about, propping it upright against a tree and then lay about admiring it for the rest of the day.

When the time came for the Yellowstone to return to St. Louis,

Stu-mick-o-sucks—the Buffalo's Back Fat head chief of the Blackfeet was painted at Fort Union in 1832.



Catlin decided not to take passage on the boat. Instead he joined two trappers who were planning to float downstream in a small boat. While floating downstream, he made many sketches of wildlife and attractive landscapes seen along the stream. He also stopped at Fort Clark to make a series of painting about life and people among the Mandan villages. At Fort Clark he did portraits of Indians from the Hidatsa and Arikara tribes. After Fort Clark, he returned to St. Louis without serious incident.

Eighteen hundred and thirty-two was Catlin's most productive year. He had traveled thousands of miles encumbered by his paintings and art materials. He had finished more than 135 pictures—an average of more than two a day.

How Catlin spent the year 1833 is something of a mystery. In his writings he mentions a trip to Utah's Great Salt Lake and certain of his paintings are credited for this year. But if he did make such a journey, he kept no field notes, and he was a prolific note taker. Some think that he spent the year

putting the finishing touches on the pictures he had painted the previous year.

Whatever may have happened in 1833, we know that he was back in the West in the spring of 1834. This time he had the permission of the Secretary of War to travel with a military detachment out of Fort Gibson on the Army's first trip into Comanche and Wichita country.

The impatient Catlin had arrived at the Fort—then the Army's westernmost Fort on the Arkansas River near what is now Muskogee, Oklahoma—two months before the Army was ready to travel.

He refused to be idle and spent the time painting among the tribes that had recently moved to Oklahoma under the Indian Removal Act of 1830. Here he added portraits of Creeks, Seminoles and Cherokees to his collection. He was acutely aware of the extent that these tribes had modified their dress and culture because of their contacts with the whites. To Catlin, that was an abomination, and it increased his

sense of urgency to complete his pictorial record before further contamination could occur.

The expedition from Fort Gibson was ill fated. The weather was hot and the prairie offered no shade to protect the men from the sun. Many soldiers died, and Catlin himself, became ill.

They encountered their first large Comanche war party on July 14. This party led them to a Comanche village on what is now known as Cache Creek west of the Wichita Mountains. While Catlin managed to paint only a few portraits here because of his illness, he was the first man to paint portraits of the Comanche.

He was too sick to accompany the soldiers when they visited the Wichita and Kiowa. Although the Comanche had a fearsome reputation for hostility toward whites, Catlin remained alone in their village painting as much as his physical condition would allow. He was especially impressed by the skill of the Comanche horsemen, and his admiration is reflected in the paintings he did during this period.

When the soldiers returned, they were accompanied by chiefs from the tribes they had visited, and Catlin was able to add portraits of Wichitas and Kiowa to his growing collection of portraits.

After returning to St. Louis, Catlin went to New Orleans to recover from his illness during the winter of 1834-35.

He was well enough to return upriver to continue his painting in the spring of 1835. For the next two years he traveled the Upper Mississippi painting the Indians of that region. In 1836 he painted his famous picture of the Indian's pipestone quarry.

In his travels, Catlin had learned the importance of the pipe in all Indian ceremonies, and had noticed that all ceremonial pipes were made of a kind of reddish stone. The Indians had told him that all the pipestone came from a common quarry, and that the quarry was one of the Indian's most sacred grounds. No white man had ever been allowed to see it.

At considerable risk to his life, Catlin found the site, now in

Pipestone County, Minnesota and painted a picture of the quarry.

In all of his travels, Catlin had never painted a single picture merely for the sake of art. First and last he was a man with a mission—a crusader. His art was only a means of promoting a better understanding of the Indian and to win favor for some project that would preserve the Indian and his way of life.

That kind of project was not clearly defined in his own mind. In his writings he had proposed the establishment of a vast National Park somewhere on the Great Plains where the Indian could continue to live and hunt as he had in the past.

To accomplish its purpose, Catlin knew that his art would have to have the widest possible acceptance and exposure. There had been a showing of his works in Buffalo, New York in 1835. Now Catlin turned from production to promotion. In 1837 he toured the principal eastern cities to exhibit his work. In 1838, he took his paintings abroad.

Catlin's art was well received, but his views were far ahead of



Catlin painted this picture of a Mandan Village in 1832. In that year he spent several weeks painting and learning about the Mandan way of life.



In 1835 Catlin traveled on the Upper Mississippi River. This picture of Kee-o-kuk—the Running Fox—on Horseback was painted while he was on this trip. Kee-o-kuk was a chief of the Sauk and Fox tribes.

the times. While Europe and the Eastern Seaboard might be ready to accept the Indian as a "Noble Savage," the West was not. To the westerner, Catlin was a soft sentimentalist at best and an outright dangerous proponent of the interest of a devious savage at worst.

To further promote his view, Catlin also became a writer. His first book, "Letters and Notes on the Manners, Customs and Conditions of the North American Indians" was published in 1841 at his own expense. In 1844 he published his second book "The North American Indian Portfolio."

Catlin had experienced phenomenal success during the production phase of his career, but now things started to turn against him. Congress rejected a proposal to buy his paintings to form the nucleus of an Indian Art Gallery, and his promotion efforts were starting to strain his finances.

During this period his wife died, and her family took his children from him on the grounds that he was now unable to support them. His creditors even

confiscated a large number of his paintings to satisfy his debts. He came to the end of his days, embittered and poverty-stricken—honored by the crown heads of Europe and by important men in this country, but he was never adequately rewarded or accepted.

Still an element of justice did prevail that was not to be apparent at the time. Eventually his major works were acquired by the Smithsonian Institution, and his views about Indians have gained a greater measure of acceptance in our time.

As Catlin became desperate for money, he frequently copied his own paintings for sale. Thus, almost identical paintings may be found in various libraries and galleries, each properly credited as a Catlin original. In some cases the copy shows greater skill of execution than the original.

To the student who studies Catlin's work—even for a short period of time—his style becomes easy to recognize. As an artist he was a primitive—self taught—and his work is a departure both in style and subject matter from what was in vogue at the time. He

was as much a pioneer in art as others had been in the settlement of the Continent.

He was best when painting the human face, but not especially adept when painting a full length portrait. Nor was he skilled at painting horses and other animals. He simply lacked a sense of proportion and perception that would have been expected of a trained artist.

His paintings also lack the accuracy of detail that became such a passion with other western artists, and sometimes he took liberties when painting landscapes. In his painting of the pipestone quarry, for example, he rearranged features and altered proportions. Such liberties can enhance art, but they compromise the historian, and we should remember that most of all Catlin wanted to become known as a historian.

Yet—all in all—his best works are good, very good. We should never forget the influence he exercised on other artists, and that he inspired others to look to the West for subject matter and inspiration.

Public Land Sales

No public land tracts were scheduled for sale at the time this issue went to press.

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